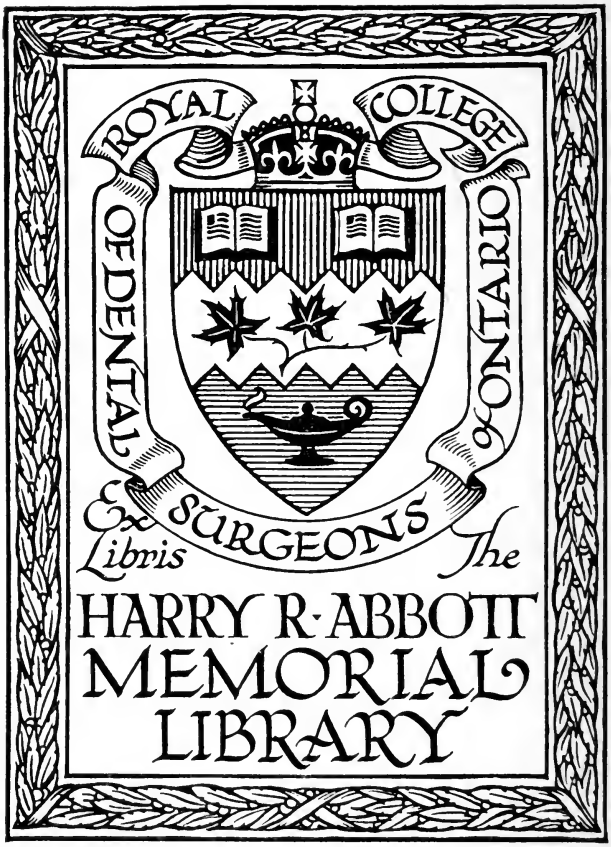
IRREGULARITIES
AND
DISEASES OF THE TEETH.

HENRY SEWILL.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IRREGULARITIES

AND

DISEASES OF THE TEETH.

A SERIES OF PAPERS FROM THE
LANCET AND *BRITISH JOURNAL OF DENTAL SCIENCE.*

BY

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PREFACE.

Of the following papers, the first two were published in the "Lancet." They were written, at the request of one of the staff of that paper, with the object of concisely explaining the causes, nature, and treatment of irregularities of the teeth—a class of affections with which many Medical Practitioners, in the absence of a Dentist, are called upon to deal, and with which they are consequently required to be properly acquainted. The requisite knowledge could previously be obtained only by a considerable study of Dentistry, and these papers were therefore designed to make the points of real importance clear, without the necessity of wading through a mass of uninteresting matter.

The remaining papers were contributed to the "British Journal of Dental Science." They consist of reports of cases from my note-book, with passing comments on their pathology and treatment. They comprise in a small space an account

of most of the constitutional and local affections associated with diseased teeth, of which a description is not to be found except in fragments scattered through physiological and medical works.

These several papers are now necessarily out of print, and I have thought that their republication might be acceptable to those who, while anxious to obtain a general knowledge of the more important topics of Dentistry, are unable to enter fully into the special technicalities of the subject.

6, Wimpole Street,
Cavendish Square,
December, 1869.

IRREGULARITIES AND DISEASES OF THE TEETH.

IRREGULARITIES OF THE TEETH.

Many subjects connected with dentistry are necessarily of great interest to general practitioners, and more especially to those who, living at a distance from London, are compelled to act on emergency as dentists. Irregularities of the teeth constitute one of the most important of these subjects, and one upon which the advice of the practitioner is most constantly sought. At the period of second dentition the child's mouth usually presents an unsightly appearance, owing to the absence of temporary teeth and the slow advance of the permanent set. Unable to judge whether the apparent deformity be transient or not, and anxious that the teeth shall, at least, not be a source of disfigurement, the parents, in the absence of a dentist, are naturally led to consult their medical attendant. Not unfrequently they

bring children, with the request that some particular temporary or permanent tooth may be extracted, the removal of which they consider will avert or cure an irregularity.

In a great number of these cases all appearance of deformity passes away as dentition becomes completed, but in a considerable proportion malplaced teeth retain their abnormal positions, and so give rise to permanent irregularities. Such irregularities tend to cause or accelerate premature decay of the teeth, and are also often alone sufficient to impair the general symmetry of the face. By judicious treatment, however, they may, as a rule, be prevented or cured; but, on the other hand, by unnecessary interference, both injury and suffering are inflicted upon the patient. It will be understood, therefore, that an acquaintance with the causes and nature of irregularities forms a necessary acquirement of those who undertake to deal with them.

Where mechanical apparatus is required, the treatment of these deformities passes beyond the province of the surgeon. He, however, ought to be able to judge when he may interfere with advantage by extracting teeth, or when he may refrain with safety, and thus avoid inflicting unnecessary pain. He should also be able to

recognize the cases which require to be promptly referred to the dentist, in order that they may not, by delay, be rendered difficult of cure, or irremediable.

It is impossible to lay down rules which shall serve the surgeon in every instance, since exceptions constantly present themselves. Nevertheless, by a brief discussion of the general characters of these affections, and by a reference to some of the more common examples, practical knowledge may be imparted to him which, as well as guarding him against error, will enable him to deal successfully with many cases. It cannot be expected that, in addition to the numerous and extensive subjects with which one in general practice has to be thoroughly acquainted, he will burden himself with complex points in dentistry. If, therefore, the part which the practitioner should take in such cases can be concisely and clearly indicated, the objects of this contribution will be fully achieved.

It may be well to premise that, in speaking of irregularities, reference is made to the permanent teeth only. No object would be gained by the treatment of irregularities of the temporary teeth, since they are shed in early life; but, indeed, they are rarely, if ever, malplaced.

The number and characters of the temporary

teeth, and their relations to the permanent set at the period of eruption, may be usefully remembered. The temporary set consists of ten teeth in each jaw—namely, four incisors, two canines, and four molars. These are afterwards replaced by the permanent incisors, canines, and bicuspids. The developing incisors and canines may be roughly stated to occupy bony crypts in the upper jaw above and behind, and in the lower jaw below and behind, the partly absorbed roots of the temporary teeth which they respectively succeed. The bicuspids replace the temporary molars, and are contained in crypts within the divergent fangs of those teeth. The permanent molars are situated in that portion of bone altogether posterior to the deciduous teeth.

The age at which second dentition commences, varying from the fifth to the eighth year, is of little or no importance, but the order in which the teeth are cut is invariable, and is as follows: first molars, central incisors, lateral incisors, first bicuspids, second bicuspids, canines, second molars, and lastly, after the lapse of a few years, the third molars or wisdom teeth.

With a knowledge of the order of eruption and of the following characteristics which distinguish the permanent from the temporary set, the surgeon

will not be likely to sacrifice a valuable tooth by mistake—an accident which happens by no means rarely. An error of this kind is, however, hardly possible, except in the case of the incisors and canines. The permanent molars will be known from their position posterior to the temporary teeth; whilst the bicuspids may be easily recognized, since no such tooth exists in the deciduous set. The permanent incisors, if present during the persistence of the temporary set, will be found posterior to the teeth which they replace. They are larger in size, firmer and denser in structure, and have along their cutting edge three small tubercles, which give them a serrated appearance. Their enamel, extending beneath the surface of the gum, terminates in an imperceptible slope towards the fang, whilst in the temporary teeth it ends in an abrupt ridge, which can be defined by the finger-nail, at the level of the gum. This distinction applies equally to the whole series. The permanent canines may be distinguished by their great size in comparison with the corresponding temporary teeth, and by their position, which is external and prominent. In the case of these teeth also, a characteristic ridge may be felt along the external alveolar wall, which corresponds to the fang of the tooth.

In terminating these preliminary remarks, it is desirable to refer to a somewhat popular error. It is commonly believed that the premature extraction of temporary teeth may act as a cause of deformity of the jaw, and thus of irregularity of the teeth. This belief is not substantiated by physiological facts, and is, moreover, disproved by practical experience. Whilst, therefore, we should guard against uncalled-for interference, we should at the same time not hesitate to extract those temporary teeth the removal of which is necessary for the cure of deformity, or for the relief of disease.

I now come to speak more particularly of the different varieties of irregularities. They may be divided into two classes :—First, those in which the jaw is well formed, but in which, owing to retention of the temporary set, permanent teeth are forced into unnatural positions. Secondly, those due to deformity of the alveoli, or of the body of the jaw itself.

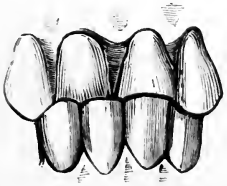
In the first class, if the temporary teeth be removed sufficiently early, those that are displaced tend spontaneously to assume their proper positions. Should, however, the deformity be allowed to continue for any great length of time, the teeth become fixed, either by the consolidation of the

bone, or by the advance of the contiguous teeth, or by the locking together of the upper and lower sets when closed. The nature of these cases will be made clear by a reference to the most common example, illustrated in Fig. 1, where the permanent

Fig. 1.

incisors of the upper jaw are seen to occupy a posterior position owing to the persistence of the temporary teeth. The prompt extraction of the latter would enable nature to effect a cure. If, however, this were delayed until the permanent teeth were fully protruded, they would pass, on closure of the jaws, behind instead of in front of the lower incisors, as shown in Fig. 2. A per-

Fig. 2.



manent obstacle to their forward movement would

thus be opposed, which could only be overcome by the mechanical means of which I have afterwards to speak.

A corresponding irregularity occurring in the teeth of the lower jaw is shown in Fig. 3, to which

Fig. 3.

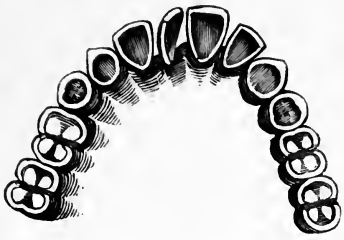
similar remarks apply. Delay here, however, is not so dangerous as in the case of the upper set. The normal position of the lower teeth being behind those of the upper jaw, the danger of locking does not exist, and mechanical interference is rarely required. The extraction of the temporary teeth should, nevertheless, not be too long delayed, lest the adjoining permanent teeth, taking a forward position, prevent the advance of those that are displaced.

This first class comprises a great variety of irregularities of the incisors. They may be crowded together so as to overlap each other, as in Fig. 4,

Fig. 4.

twisted on their axis, as in Fig. 5, or, indeed, may

Fig. 5.



be displaced in almost any direction. The duty of the surgeon is to promptly extract the offending temporary teeth, and, should the deformity not speedily decrease, at once to refer the case to the dentist.

The canines are very subject to displacement, being frequently forced into an external prominent position. This constitutes a very unsightly irregularity. The common practice in such cases is to extract the projecting teeth. Such a proceeding cannot be too strongly denounced. The canines are the strongest and most durable of the teeth; they contribute most to the symmetry of the mouth, with the exception of the incisors, and they can, moreover, almost invariably be brought by treatment into their proper places. It may indeed at once be stated that the extraction of a permanent incisor or canine for the cure of irregularity is very

rarely justifiable. Obstructing temporary teeth should first be removed. Should it be absolutely necessary subsequently to sacrifice a permanent tooth, the choice will, as a rule, fall upon the first molar. This tooth, unfortunately, even in early life, is either so extensively carious as to require extraction, or is at least in a condition in which it could not be expected to endure during many years. If, however, the first permanent molar be free from decay, the choice may fall upon the second bicuspid, the loss of which is but little damaging to the appearance.

It may, perhaps, be asked how the extraction of a tooth situated so far back as the first molar can relieve crowding at the front of the mouth. It is found that on the extraction of such a tooth the pressure is very rapidly relieved, that the crowded teeth spread equally apart, and that in a comparatively short time the space previously occupied by a large tooth becomes obliterated.

The required room being thus gained, nature will in many cases complete the cure; in some a mechanical apparatus will be necessary.

After the general observations that have been made the bicuspids may be dismissed with the remarks, that they are sometimes displaced by the retention of portions of the deciduous molars, that

this displacement is usually in an inward direction (Fig. 6), and that the treatment is similar to that of the incisors.

Fig. 6.

The molars are rarely malplaced except in cases due to malformation of the jaw. Irregularities of this class will occupy my next paper.

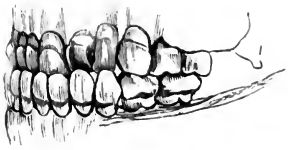
Irregularities due to malformation of the jaw are now to be considered. In the recognition of these cases the point of the greatest value obviously is a knowledge of the exact form of a well-shaped maxillary arch. The anterior portion of this arch, containing the incisors, canines, and bicuspids, forms an almost perfect semicircle, whilst those portions containing the molars continue the arch backwards in slightly curved and divergent lines. Flattening or contraction of this arch, or abnormal development of any portion of it, give rise to irregularities of the teeth.

This class of irregularities is most frequently congenital, and at the same time hereditary, a peculiar abnormality of the jaw being, in this manner, reproduced in many members of a large family. They may, however, be due to injury or to other accidental causes. Their nature will be rendered evident by a few typical examples. Fig. 7 represents an extreme instance of a common

Fig. 7.

variety. Here we see a protrusion of the central incisors, apparently due to abnormal development of the premaxillary bone. Fig. 8 illustrates a

Fig. 8.



somewhat similar deformity of the lower jaw, due to a maldevelopment of the anterior portion of

the alveolar ridge. An individual affected with this deformity is said to be underhung, the four incisors, and sometimes the canines, passing without the upper teeth when the mouth is closed.

The V-shaped or contracted arch, instances of which daily present themselves, is shown in Fig. 9.

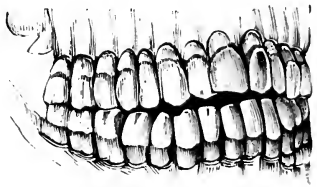
Fig. 9.

This gives rise to endless varieties of displacements of the teeth. The incisors and bicuspids are often forced inwards, the canines generally in the contrary direction ; so that an irregularity exceedingly damaging to the expression of the countenance is the result.

A somewhat rarer example, shown in Fig. 10, is equally disfiguring in its effects. In this example the molars approximate on closure of the mouth, but the incisors remain apart and cannot be brought into contact. This is in consequence

of a malformation of the posterior portion of the lower jaw, by which the molars, being placed on

Fig. 10.



too high a level, prevent the rest of the set from coming together.

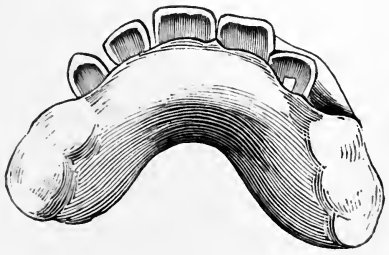
The distinction between the first and second classes of irregularity is rendered manifest by these examples, and nothing would be gained, did space allow, by multiplying them. It is evident that little can be done by the surgeon in the second class. In the treatment of this variety, it is necessary in the first place, to consider the desirability of extracting teeth for the sake of obtaining space. Secondly, where teeth must be sacrificed, it is necessary to decide which of them can be removed with the greatest advantage. Next comes the question of the extraction of such malplaced teeth as are not amenable to mechanical treatment. Lastly, there is the designing and construction of the mechanical apparatus required for the completion of the cure. With the many

details here involved, none but those who make dentistry a special study, can be expected to be practically acquainted, and these cases must, therefore, be considered almost altogether beyond the province of the medical practitioner.

A few remarks on the mechanical treatment of irregularities may be added in conclusion. They will be of service in determining the cases which are capable of being either improved or cured by the application of apparatus.

Instruments for the purpose of altering the position of malplaced teeth are constructed to fulfil two objects : to prevent the locking together of the teeth on closure of the mouth ; and to exert such continued pressure or traction on those teeth which are irregular, that they may be gradually compelled to assume a normal position. To fulfil these objects, a plate of metal or of vulcanised india-rubber, as shown, *in situ*, in Fig. 11,

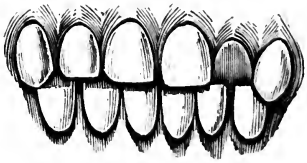
Fig. 11.



is accurately adapted to the teeth and palate, the molars being covered with sufficient thickness to prevent the front teeth from meeting. A fixed point is thus formed, to which springs or levers, elastic bands or wedges of wood, may be attached in any desired situation. These may be arranged to exert, with great nicety, any amount of force required, and to effect the desired result without exciting unnecessary inflammation.

In order to make this treatment more clearly understood, two of my recent cases may be described. Fig. 11 shows, in position, the instru-

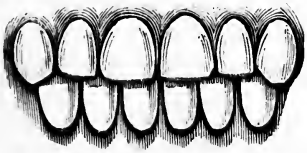
Fig. 12.



ment employed in the regulation of the case represented in Fig. 12. This was an irregularity of the first class, one lateral incisor being displaced inwards, and held in its malposition by the lower teeth on closure of the mouth. The plate covering the molars kept the jaws sufficiently apart to prevent the front teeth from meeting. The obstacle to the forward movement of the tooth being thus removed, but a slight amount

of pressure was required to force it into its normal position. To obtain this pressure a piece of compressed hickory was fixed between the plate and the back of the tooth. The moisture of the mouth caused the wood to expand, and, in expanding, to drive the tooth slowly in the desired direction. The wood was renewed by larger pieces at intervals of a day or two, as the cure progressed, until at length, the teeth having assumed the regular

FIG. 13



appearance, shown in Fig. 13, the case was dismissed.

The next case, of which Fig. 14 is a representa-

FIG. 14.

tion, was of a somewhat different character. The irregularity here consisted of a twisting of the central incisors on their axes. The apparatus

with which it was treated is shown *in situ* in the next drawing (Fig. 15). It consisted of a vulcanite

Fig. 15.

frame, closely in contact with the inverted angles of the teeth, but clear of the rest of their surfaces. From each side of this frame there proceeded a flat spring of hard gold wire, and these, extending round in front, were arranged so that their free extremities kept up constant pressure on the everted sides of the irregular teeth. By this means the distorted incisors were compelled gradually to revolve, and in a comparatively short time the

Fig. 16.

deformity was entirely removed. Fig. 16 is from a cast of the case after treatment.

By similar contrivances the alveolar border, and even the whole jaw, may, when necessary, be modified in form. For instance, in the contracted or V-shaped palate, an apparatus would be made to maintain equal pressure from within outwards along the alveolar margin. In time the required expansion of the arch would be accomplished.

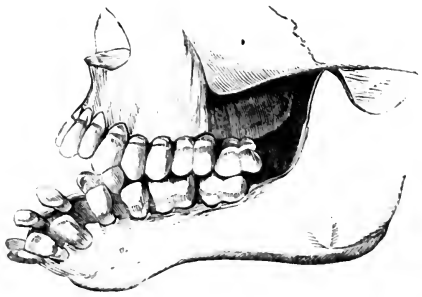
Other cases may be advantageously dealt with by instruments fixed externally. Thus the case represented in Fig. 10 would be treated by a constant upward traction of the chin, a cap of leather adapted to that part being attached to a strap across the head by strong elastic bands at each side.

Fig. 17.

This apparatus and its application are shown in Fig. 17.

The almost marvellous manner in which the jaws may be modified in shape by the continued application of force in one direction, is not uncommonly illustrated in surgical cases. The sequel of extensive burns of the front of the neck furnishes, occasionally, an instance in point. The cicatrix resulting from such an injury has a constant tendency to contract. It draws the chin unceasingly towards the chest, and in time causes the body of the jaw to curve downwards. In cases not uncommonly met with, the curvature is so great that the alveoli are completely everted, and the incisors turned altogether outwards or even downwards. One of these cases is well shown in the annexed engraving (Fig. 18).

Fig. 18.



From a consideration of the principles upon which the mechanical treatment of irregularities is based, it will probably suggest itself that this

treatment can be much more rapidly and effectually carried out in the child than in the adult. At the age at which the alveoli are in process of growth, and when they do not closely embrace the teeth, a malplaced tooth can be drawn into position in a short time, and with the exercise of but slight force; whereas in the adult, the bone being consolidated, the process is long and tedious. For the same reasons, the cases in which the shape of the jaw has to be modified are much more amenable to treatment at an early age than at a later period, when the osseous system is fully developed. If, therefore, the opinion be formed that the treatment of a case of irregularity cannot be undertaken without mechanical aid, no time should be lost in the construction and application of the necessary apparatus.

ON DISEASES OF THE TEETH.

In the review of Mr. Christopher Heath's work in the last number of the Journal, it is justly pointed out that, "in proportion as dental surgery has been advanced to its legitimate position it has assisted the general surgeon to a better knowledge of many diseased conditions of the jaws which had hitherto escaped his notice until they presented formidable or malignant characters, such as rendered surgical interference, if not fatal, at least difficult and dangerous." It is gratifying to find that facts of this kind are becoming appreciated by the medical profession, and that, accordingly—the constitutional as well as the local effects of dental disease being recognized—many cases which require the co-operation of the dentist are now frankly referred to him both by physicians and surgeons.

Facial Neuralgia.—Cases of facial neuralgia—among affections which come under the care of the physician—are almost invariably referred to the dentist, in order that diseases of the teeth, constitu-

ting, probably, the exciting cause of the pain, may be removed before medical treatment is commenced. No affection falls in the first instance more legitimately within the province of the dentist. When we remember the physiological fact that irritation of a nerve commonly manifests itself by pain at some point distant from the seat of injury, and when we consider that the fifth nerve, which supplies branches to the teeth is distributed also to nearly the whole of the head and face, and that comparatively few persons are entirely free from dental disease involving irritation of fibres of this nerve, it is not difficult to understand that affections of the teeth are the most frequent exciting causes of neuralgia of the face, and that this is among the most prevalent of diseases. For these reasons it is evident that until every trace of dental disease has been removed it is impossible to assert with confidence that a case of facial neuralgia is due to constitutional causes alone. As to the proportion of cases, however, distinctly traceable to each cause, considerable difference of opinion prevails. Thus, Gross declares the vast majority are due to diseased teeth, while Dr. Aitken appears to hold the opposite opinion. Dr. Handfield Jones describes three well-marked varieties of facial neuralgia: 1st, the reflected or sympathetic,

such as is excited by carious teeth; 2nd, that produced by organic central disease; 3rd, the variety due to nerve debility caused by the special miasm which gives rise to ague, or by other influences. This uncertainty existing, it becomes more than ever the duty of the physician to allow no probable exciting cause to escape him. The teeth are undoubtedly among these causes, and since it is at all times a desirable object to bring them into a healthy state, the physician should have no hesitation in seeking the co-operation of the dentist in every case of facial neuralgia. Moreover it is not sufficient to take the patient's assurance that his teeth are not decayed, or that he does not suffer from toothache. Patients are often unconscious of the presence of disease, and teeth which do not ache are frequently the excitants of neuralgic pain. No practitioner would proceed to treat a case of neuralgia of the knee in a child until he had examined the hip-joint, the most probable seat of disease, nor would he treat neuralgia of the right shoulder before inquiring into the state of the liver, nor pain in the left upper arm before examining the heart. Can he then, consistently, ignore the teeth when dealing with neuralgic pain of the face?

I, however, by no means deny the existence

of idiopathic neuralgia. I admit that it may be common in malarious districts, but I believe that it is comparatively rare in London. There is one point which should be borne in mind, and which is well expressed by Dr. Brinton. He remarks, "There are plenty of facts which suggest that lesions of nerves not necessarily painful may become so from causes originally by no means local. Thus, I believe there are hundreds of people walking about London this minute, the diseased nerves of whose carious teeth would be speedily roused into severe neuralgia by two or three nights of sleepless watching and anxiety, or by two or three days of insufficient nourishment, or of violent and exhausting exertion of mind or body. And, conversely, I am sure that a generous diet will often relieve the agony arising from sheer involvement of nerves in a cancerous deposit." Here we have the explanation of the fact that many cases of facial neuralgia due to the teeth are cured by quinine or other tonics. The cure is, however, not permanent, or at least the patient is liable to relapses until the *fons et origo mali* be removed.

At the West London Hospital many cases of neuralgia come under my notice, and I think it is the general custom of the staff to send their patients for an examination of the teeth. This

examination is most carefully made, so that no carious cavity or other mark of disease shall escape. Those teeth which are hopelessly diseased, that is, which evidently cannot be brought again into a healthy state, are at once removed. Among these I enumerate teeth which are too extensively carious or broken down for filling, or which are affected with necrosis or exostosis or chronic alveolar abscess. These necessary operations, formerly so much dreaded by the patient, are now performed without hesitation, since they may be rendered painless by nitrous oxide gas, or by some other of the harmless anæsthetics which we now possess. Carious cavities are next filled, and in this great care is taken to prevent increase of the susceptibility of the teeth to changes of temperature. For this purpose the so-called osteoplastic answers admirably, and in those cases where the pulp is exposed or only protected by a thin layer of dentine, a coating of this filling is always placed at the bottom of the cavity. Where inflammation of the gums and periostitis prevail, local means are taken to subdue them, while at the same time attention is given to the general health. In some cases iodide of potassium is administered; in others, where the patient is debilitated, quinine and iron are prescribed.

The following cases will illustrate this treatment. The first is typical of a very large class.

M. B—, æt. 25, applied at the hospital on February 11th, 1868. She had been, as she expressed it, "a martyr to face-ache" for many months. The attacks usually came on in the evening, and affected the right ear and the right side of the face. The pain sometimes extended down the neck and arm of the same side. She had decayed teeth which occasionally ached. On examination the right lower wisdom tooth and second molar were found extensively carious and very tender. These were extracted, and five weeks afterwards the neuralgic pain had not recurred. It is interesting to remark how commonly, as in this case, "ear-ache" is associated with disease of the teeth of the lower jaw.

S. J—, æt. 50, applied May 8th, 1868. He described pains of a neuralgic character about the head and face, from which he suffered. He said he had no decayed teeth, but some of them ached after contact with hot or cold fluids. Examination showed that there were no carious teeth, but that the palatine fangs of both the right and left upper first molars were exposed by the absorption of their alveoli, and were necrosed and coated with tartar. These were the sensitive teeth. They

were extracted, and the result has been the cessation of the neuralgic attacks.

A young lady, about 20 years of age, was sent to me on October 8th, 1867, by Dr. Norton, of Bayswater. She had been residing in the West Indies, and had suffered whilst there and since her return from frequent attacks of excruciating neuralgic pain. She had been in the habit of taking large doses of quinine and other remedies without apparent effect. She had decayed teeth but no toothache. On examination it was found that the lower bicuspids on each side were decayed and broken down to a level with the gum, but they were not tender, and did not appear to be the seat of active disease. There were a few cavities in other teeth with sensitive dentine, but no exposure of the pulp.

The roots were extracted. They were found to be enormously exostosed, their apices being enlarged to a size almost equal to that of an ordinary crown of a bicuspid. The carious cavities in other teeth were filled. This treatment was followed by a permanent cure of the neuralgia.

Rev. P. C—, æt. 43, of rheumatic diathesis, applied to me, December 27th, 1865. He had been suffering for a considerable period from facial

neuralgia. During the last few weeks the whole of his teeth had become tender and loose. The teeth were found free from caries, but were the seat of general periostitis. There was slight absorption of all the alveoli. The second molar and wisdom tooth of the right upper jaw were hopelessly loose. They were extracted. Three grains of iodide of potassium in an ounce of decoction of bark were ordered to be taken three times a day. The bowels were also attended to. Blood was abstracted locally by dividing, with a sharp scalpel, the swollen gum in the interstices of the teeth, and washing the mouth with warm water, and this operation was repeated on several occasions. Under this treatment all the symptoms disappeared in the course of a month, and the neuralgia had not returned when I saw him on July 8th, 1867.

G. S—, æt. 20, a student of medicine, applied to me at the commencement of the last long vacation. He said he suffered from "maddening" attacks of neuralgia, which came on generally when he was working hard and confined to the house. These attacks subsided under the administration of purgatives followed by large doses of quinine. He had toothache also, but his teeth

were so bad that he had been afraid to have them looked at. It was found that he had hardly a sound tooth in his head, and that about eight of them were broken down beyond repair. The latter were extracted and were found in various conditions of old-standing disease, some exostosed, others necrosed, and nearly all coated with organized lymph. The cavities in other teeth were filled. The treatment was followed by a permanent cure of the neuralgia.

This case falls under the class to which apply the remarks of Dr. Brinton. Numerous nerve-fibrils are subjected to chronic irritation. When the patient is in robust health, pain is manifested only in the immediate neighbourhood of the disease, namely, the decayed teeth. When, however, he becomes depressed and when his general health is disordered, the irritation which had previously given rise to toothache only, now brings on wide-spreading neuralgia. Relieve his loaded bowels and stimulate him by large doses of quinine and the pain vanishes, only, however, to return again and again under similar circumstances, as long as the exciting cause remains.

The following case will serve to exemplify that

variety of facial neuralgia which, defying all local and even constitutional treatment, must be ascribed to some deep-seated cause.

A. M—, æt. 64, applied at the hospital on July 24th last, for the purpose of having the last of her teeth, a lower canine which was very loose, extracted. She volunteered the statement that for several years she had been a sufferer from neuralgia. Her teeth had all decayed, but their extraction afforded no permanent relief. She pointed to the course of the nerves over the right side of the face as the seat of pain, and this she said was of the most agonising character. The right eye too was affected during the attacks, and tears flowed in abundance. Her general health, with this exception, remained pretty good. She had been treated at various hospitals and dispensaries without permanent relief. She believed, however, that the pain was mitigated and sometimes stopped by the aconitine ointment, which she rubbed in vigorously with the point of her finger at the painful parts.

Indigestion.—In indigestion, much can be done by the dental surgeon to assist the physician in his treatment. The presence of a few

carious and tender teeth is often sufficient to prevent the effectual mastication of the food, much of which is consequently swallowed in masses, which, resisting the action of the gastric and intestinal secretions, pass through the digestive canal entirely unaltered. Among the minor and common effects of impaired mastication is the occurrence of dyspepsia and colic, more or less severe in character, caused by the presence of such indigestible masses in the alimentary tract, which from their unaltered condition assume the nature of foreign bodies, and thus become a source of irritation. These circumstances in persons of vigorous constitution may be productive of no further evil, but in those of delicate health, and with powers of digestion naturally feeble, they may most materially aggravate the particular symptoms under which the patient labours. This is more especially the case in those afflicted with diseases which are associated with mal-assimilation, such as scrofula and consumption. In these individuals it is almost invariably found that the teeth are of the most defective character, so that those in whom it is most necessary that the food should be perfectly triturated in order to facilitate the work of the digestive apparatus are, as a rule, least able to prepare their food for these already

overburdened organs. Similar observations apply to persons of advanced age. The teeth have usually been lost by the time when, from decay of the constitution, the digestive powers are becoming feeble, and thus food is swallowed in a condition in which it can be but imperfectly acted upon or assimilated.

It will be seen that much good may be achieved by restoring the power of mastication either by bringing remaining teeth into a healthy state, or by the insertion of artificial substitutes for those that are absent. In hospital practice we are restricted to the first of these means, because, for obvious reasons, we cannot supply the patients with artificial teeth, and thus unfortunately the good which might be done is curtailed. Speaking to me on this subject a few weeks ago, my colleague, Dr. Maudsley, remarked how hopeless was the treatment of some cases of dyspepsia, in which, owing to the loss of teeth, mastication could not be performed. He suggested that the institution of a charity for supplying the poor with artificial teeth would confer a real benefit upon many. This practicable suggestion, it appears to me, is well worthy of consideration, and therefore I here publicly record it.

I have notes of many cases in which immediate benefit has arisen from restoring the power of mastication by the insertion of artificial teeth. The following is a striking example. It forms the sequel of a case which I described before the Odontological Society early last year, and which was published in the Journal.

A. S—, æt. 23, was sent to me on November 22nd, 1867. She presented a good example of that class whose delicate frame, brilliant complexion, and large eyes, we are wont to consider to some extent characteristic of phthisis. Of this disease, however, no active symptoms were to be observed. She came to consult me about a fistulous opening on the face near the angle of the jaw on the left side, which, with short intervals of closure, had existed for two years. She had applied to an advertising "Dental Firm," who, disregarding the principal causes of her sufferings, had contented themselves with inserting an upper set of teeth attached by pivots to remaining roots.

She informed me, that in addition to the annoyance of the chronic fistulous discharge, she had toothache and frequent neuralgia. She could not attempt mastication, and hence confined herself

almost entirely to liquid food. Dyspepsia with her was constant. Her appetite was bad, and she suffered from headache and from colic and disorders of the bowels. She was thin, and thought she was losing flesh.

Every tooth in her head, with the exception of the lower incisors and canines, was found decayed and broken down to a level with the gum, the external discharge obviously proceeding from the chronic suppuration about those in the left lower jaw.

She was placed under the influence of chloroform on two occasions (nitrous oxide was not yet in use as an anæsthetic), and the whole of the decayed roots were extracted. This was followed by the rapid healing of the fistula, and by an immediate amelioration of the general health. The greatest benefit was, however, manifested, when, after the lapse of a proper time, a set of teeth was provided with which she was enabled thoroughly to masticate her food. Her dyspepsia vanished, and no longer restricted to fluids, she availed herself of a suitable nourishing diet. The result has been—increase of flesh, improvement of appetite, of colour, and of spirits, until she is now in every respect in perfect health.

This case suggests some remarks upon the

subject of the extraction of decayed roots preparatory to the insertion of artificial teeth. It is commonly believed that the removal of roots is in every case necessary. On the contrary, whilst the presence of any number of roots rarely prevents the adaptation of serviceable artificial teeth, they may, when they remain firm and free from pain, be often retained with advantage. It is only in cases such as that last related, where they are a source of constant suffering to the patient, that their removal becomes desirable, and then not so much to facilitate the insertion of artificial teeth, as to relieve the patient, and to prevent the evil effects upon the health, which are so often induced by extensive dental disease.

Necrosis of the Jaw.—Two cases of necrosis of the jaw in infants have recently been referred to me by the surgeons of the hospital. They illustrate a point which has more than once given rise to discussion, namely, whether after the removal of portions of dead jaw-bone, together with the crypts containing rudimentary permanent teeth, these teeth are redeveloped in the new bone which may be formed?

I need not relate my cases in detail. In both

there was a history of inflammation commencing in the gum about the temporary teeth, spreading thence from the alveoli to the periosteum of the jaw, and terminating in death of a portion of bone. As usual in these cases, the children were cachectic, and the treatment was therefore directed more particularly to the general health. Locally detergent lotions were used to overcome the horrible fetor. The dead bone was not interfered with until perfectly detached, when it was drawn out through the openings in the gum.

In the first case a portion of bone was removed *en masse*, containing the lower temporary incisors. The necrosis had stopped short in the direction of the permanent saccules, and these did not come away. In this instance, therefore, I confidently anticipate that the permanent teeth will in due course appear.

In the second case, which was in the upper jaw, the temporary teeth fell out, and the alveoli exfoliated, and small pieces were from time to time brought to me by the mother. At length larger masses became detached. These were removed, and in them were contained the developing permanent central incisors. In this case I have equal confidence in predicting that permanent incisors will not be produced. In cases like these,

in which the teeth have been supposed to reappear, the explanation is, that the saccules with the rudimentary teeth have not been removed but have remained attached to healthy tissue, and have in time become surrounded by new bone. It is contrary to all physiological principles that a structure so complex as a tooth crypt and its contents could be redeveloped after destruction by disease.

Cases such as I have here related, and which cannot be uncommon in the practice of most dental surgeons, suffice to show that dentistry is no unworthy ally of medicine. But, indeed, if the prevention and cure of disease and the relief of suffering constitute the practice of medicine, does not dentistry occupy *par excellence* the position we claim for it as a branch of the practice of medicine in the broad sense of the word ?

In my last contribution, several subjects of considerable interest and importance were briefly touched upon, and to these, as they are worthy of more lengthy discussion, I will now return.

Neuralgia.—First, with regard to neuralgia. I mentioned the physiological fact that irritation

of a nerve commonly manifests itself by pain at some point distant from the seat of injury, whilst not unfrequently the injured part itself remains free. Being ignorant of the manner in which influences are communicated from one part to other parts of the nervous system, we cannot account for these phenomena, which, nevertheless, present themselves daily in the observation of disease,—as already exemplified by an inflamed liver giving rise to pain about the right shoulder; a diseased hip-joint producing pain at the knee; and an irritated tooth-pulp exciting pain at remote parts of the head and face.

The following cases, bearing upon this subject, which are quoted by Dr. Handfield Jones, may be here cited as a supplement to those related in my last paper. "Freidberg records four cases of severe pain in the face, involving in three all the divisions of the fifth nerve, and refractory to all internal treatment, which at length yielded to the extraction of one carious tooth. The remarkable circumstance was, that other carious teeth had been previously extracted without relief, although they were painful and aching, while the tooth which appeared to be the cause of the neuralgia was painless."

Beyond merely exciting distant pain, irritation

of a peripheral nerve may give rise to functional disturbance of the brain, or other great nerve-centres, resulting in various phases of morbid action. "Dr. Brown-Séquard maintains," says Dr. Handfield Jones, "that various forms of vertigo, of epilepsy, and also of hysteria, chorea, tetanus, &c., may be due to irritation starting from a centripetal nerve, and frequently slightly felt, or unfelt, at the seat of injury; and that suppression of the irritation may promptly cure the patient. Graves reports a case where an extremely severe cough, which had resisted all treatment directed to relieve bronchitis, ceased at once on the expulsion of a mass of tapeworm by a dose of turpentine. It does not appear that any symptoms had existed in this case to announce the presence of the intestinal parasite. Perhaps the following instance is still more proving, inasmuch as the seat of irritation was in a much more sensitive part. A married lady had suffered for a considerable period from a spasmodic pain in the womb, which ceased completely on the extraction of a tooth that had not caused any material annoyance."

I must not be understood to imply from this that dental disease, except in rare cases, is the exciting cause of nervous affections of a nature

more alarming than neuralgia. My object is to show that the phenomena of this disease are among the most ordinary and least wonderful of the inexplicable manifestations of reflex nervous irritation. There is, however, abundant evidence that grave derangement of the nerve-centres does occasionally result even from the mere irritation of the dental nerves. For instance, Mr. Tomes relates two cases of epilepsy which, resisting all previous treatment, were cured by the extraction of exostosed teeth. A further illustration is furnished by the diseases of the teething period in infants. At this period, the nervous system is very susceptible of morbid influences, and it commonly happens that disorders of an aggravated character are produced by the irritation of the dental nerves occurring during difficult dentition. That this irritation is often the sole cause of the symptoms is proved by the fact that in many cases an attack of convulsions is instantly cured by an incision into the indurated gum covering a developing tooth.

Reverting to facial neuralgia, if to all these facts we add that there are no symptoms which serve to distinguish the variety of the disease due to constitutional causes from that set up by local irritation, it will be seen that the importance of

searching for these local causes cannot be over-estimated.

The examination of the teeth should be made by a skilled person. It is not sufficient to glance into the mouth for carious cavities, each tooth must be separately explored with the aid of instruments and a mouth mirror. A careful search must be made in the interstices of the teeth, where carious cavities are often concealed. It is next to be remembered, that neuralgia may be excited by necrosis, by exostosis, and also by inflammation and thickening of the dental periosteum. The signs of these diseases must therefore be looked for. In the absence of other symptoms, the offending tooth, when the mischief is situated about the root, will be sometimes discovered by a current of cold water, or by a smart tap with an instrument. Should it be loose or discoloured, or should its alveolus be absorbed, it will of course readily attract attention. It must be borne in mind, however, that in these cases every decayed tooth is by no means condemned to extraction. Neuralgia may frequently be effectually guarded against by filling cavities of decay, and so protecting the sensitive structures of the teeth from irritation and from sudden changes of temperature. I alluded to the value of the so-called osteoplastic

filling in this treatment. The following case will illustrate its use :—

Three years ago a member of our profession had a lower molar filled with gold. The tooth was extensively carious, and the pulp was nearly exposed. After the operation, it remained sensitive to changes of temperature, and when it was touched by anything extremely cold there resulted pain of a neuralgic character, shooting along the right cheek and eyelid. Having waited several months in the hope that the sensibility would subside, I removed the gold, filled the bottom of the cavity with osteoplastic, and, when this became hard again completed the stopping with gold.

The osteoplastic being a very bad conductor of heat, prevents the communication of sudden changes of temperature to the pulp, and since the tooth was refilled, it has remained under all circumstances free from pain, and the neuralgia has not recurred.

Digestion.—A few more remarks now upon the teeth in relation to digestion.

The principal office of these organs is to triturate the food, and to mingle it with the salivary secretions. This act, which constitutes the first

step in the process of digestion, is recognized by all physiologists and physicians as an operation of great importance. Were other evidence wanting, it would, indeed, still be obvious that nature would not have provided so perfect an apparatus for the trituration of the food, and so complex an arrangement for the secretion of saliva during the act, if mastication could be dispensed with. The utility of this process can be, however, more directly demonstrated. Mastication effects changes in the food which very materially influence the subsequent stages of digestion. These changes are of two kinds—mechanical and chemical. Of the first, Dr. Carpenter says, "Mastication is evidently an operation of great importance in preparing the substances afterwards to be operated on for the action of their solvents; and it exactly corresponds with the trituration to which the chemist would submit any solid matter, that he might present it in the most advantageous form to a digestive menstruum. The complete disintegration of the alimentary matter is, therefore, of great consequence; and, if imperfectly effected, the subsequent processes are liable to derangement. Such derangement we continually meet with, *for there is not, perhaps, a more frequent source of dyspepsia than imperfect mastica-*

tion, whether resulting from the haste in which the food is swallowed, or from the want of the instruments proper for the reducing operation."

The chemical changes accomplished during mastication are due to the saliva, which, acting upon the insoluble starchy constituents of the food, converts them into sugar, a perfectly soluble compound, capable of being at once taken up by the absorbents of the stomach. If, however, these constituents of the food be unacted upon in the mouth, they remain unchanged until passing from the stomach they enter the intestine, and become influenced by the pancreatic and other secretions. Under such circumstances, it is clear they may become a source of irritation in the stomach, and their digestion must impose an extra burden upon the intestinal portion of the alimentary tract. On this point Dr. Habershon writes, "Imperfect mastication greatly increases the work of the digestive organs. . . . . The action of the saliva upon the starchy elements of farinaceous food is also facilitated when sufficient time is allowed for the food to be thoroughly mixed." Upon the same subject, Dr. Leared says, "It is most important that solid food should be duly prepared, by chewing, for the action of the stomach; and it is also important that the starchy elements of the

food be sufficiently submitted to the action of pure saliva."

The evil effects which arise from inability to masticate vary in degree of severity with the age and constitution of the patient. They seldom pass in the robust adult beyond an occasional attack of dyspepsia. It is, however, evident that inability to masticate may produce more serious results in those whose digestive power is naturally weak, and who, under favourable circumstances, would find a difficulty in digesting even the most carefully selected diet. Masses of food, acting as mechanical irritants, may keep up chronic dyspepsia; and, at the same time, the difficulty of assimilation being increased, it is reasonable to infer that general debility, already existing, may be aggravated. Such results might be anticipated in scrofula and consumption, diseases to a great extent connected with mal-assimilation, that is, in which, owing to some constitutional defect, the processes of nutrition are imperfectly performed. Indigestion of the most marked character is invariably present in these affections. "Ever since tuberculosis has become more studied as a constitutional affection," says Dr. Aitken, "it has been rendered more apparent that the disorder of the digestive organs is the primary disorder of func-

tion which ushers in the cachexia; and that a certain form of dyspepsia is not only present in the hereditary strumous constitution, but is capable of generating the bad habit of body, and of leading ultimately to the deposition of tubercle." It is a remarkable fact, that in these diseases the teeth are in most cases of so defective a character, that mastication can be but imperfectly performed. Now, without by any means assigning to the teeth a share in the causation of "strumous dyspepsia," which undoubtedly depends primarily upon some innate defect, I am convinced, from the observation of a considerable number of cases, that it is most materially aggravated by inability to masticate, and that the restoration of the function of the teeth is of great value as an aid in its relief, and also in the amelioration of the general symptoms.

It must be sufficiently obvious, from a consideration of the physiology of digestion, that dyspeptic symptoms of any degree of severity may have their entire origin in the condition of the teeth, and that there is no case of indigestion which will not be aggravated by inability to masticate. It is often difficult to fix upon the actual cause of disorder in a process so complex as digestion, in which the functions of many distinct

organs are engaged. If, however, dyspeptic symptoms become mitigated or cured on the restoration of a function previously suppressed by disease, there can be no reasonable doubt that the suppression of that function had at least a share in originating them.

In the following cases the exciting cause of the disorder was, clearly, inability to masticate, in other words, omission of the first act in the process of digestion, which it is the function of the teeth to perform. Instances of a similar kind are common.

N. S—, aged 56, a vigorous country gentleman, was brought to me in January, 1867, by Dr. Skimming, of Molesey. He stated that his appetite was good, but that being toothless he was obliged to "bolt" his food. His dyspeptic symptoms were flatulence and eructations, and occasional attacks of severe griping pain, coming on an hour or two after meals.

A set of teeth was made for him. He remained continually under observation after these were inserted, and there was no return of the dyspepsia.

The next case was of a more serious character.

Mrs. A. M—, aged about forty-five was sent to

me in June, 1866, by Dr. Bate, of Maida Hill. She suffered from frequent headache and from that characteristic mental depression which, being so universally associated with indigestion, has caused dyspeptic and hypochondriac to become almost synonymous terms. She complained of pain in the stomach after meals, of occasional vomiting, and also of eructations of fetid gas. Her tongue was foul, her appetite bad, and her bowels irregular. These symptoms had persisted in spite of Dr. Bate's judicious medical and hygienic treatment.

On inquiry I found that during the last ten years she had been wearing a set of artificial teeth, with which she had never been able effectually to chew. They had been altered several times, as remaining natural teeth decayed, and this had rendered the fit so imperfect that for a long time they had been quite useless in mastication.

I made a set of teeth for her, and the medical treatment was again resumed. This time it was successful, and the indigestion yielded to measures which hitherto had proved entirely ineffectual.

I have already remarked that inability to masticate may undoubtedly constitute the sole cause of indigestion, and that it must in every

case aggravate dyspeptic symptoms originating elsewhere. When, however, it is asked if it be the invariable custom of practitioners in cases of dyspepsia to inquire whether the function of the teeth is properly performed, I am afraid we must answer that this matter is too often overlooked by the physician as well as by the patient. Every organ concerned is carefully examined, the teeth are forgotten. It is difficult to account for this. The importance of mastication is, as we have seen, fully recognised by physiologists and physicians. That the power of mastication lost in consequence of the absence or disease of the teeth, can be, in the vast majority of cases, effectually restored by the dentist is also invariably pointed out by writers on indigestion. I will not however dwell longer on this topic, but will content myself in conclusion, with adding the following extract from the well known work of Sir Thomas Watson. The testimony of such an authority alone is sufficient to show that I have neither exaggerated the importance of the relation which the teeth bear to the disorders of digestion, nor over-estimated the value of the aid which dentistry furnishes in the treatment of the varied conditions of disease which are classed under the common term dyspepsia.

Sir Thomas remarks, "I am not at all sure that

the increased longevity of modern generations is not, in some degree, attributable to the capability of chewing their food which the skill of the dentist prolongs to persons far advanced in life."

We thus see that when in a state of disease, besides being a source of intense local suffering, the teeth are frequently the exciting cause of pain extending over the head and neck, and even to more remote parts of the body, in consequence of the irritation produced by them being communicated to the nerves supplying those parts. We find further that the teeth are intimately associated with the disorders of the digestive functions. In addition to this, diseased teeth are among the commonest exciting causes of various surgical affections of the jaws and neighbouring parts, such as necrosis, ulcerations, abscesses, and tumours of several kinds.

Some of these affections will form the topics of my next paper.

I CONCLUDED my last paper with the remark, that diseased teeth were among the commonest exciting causes of various surgical affections of the

jaws and neighbouring parts, such as necrosis, ulcerations, abscesses, and tumours of several kinds.

These facts are duly recognized by surgical authorities. Thus Gross remarks, "The influence of the teeth in inducing and maintaining ill-health in the jaws, gums, eyes, ears, head, and lymphatic ganglions, as well as in other parts of the body, is displayed in a great variety of ways, and deserves the most careful consideration of the general practitioner. Without an intimate knowledge of their relations, he must remain ignorant of the pathology of some of the most common affections about the head and face, and be consequently unable to treat them upon correct scientific principles." Mr. Liston, in his "Elements of Surgery," says, "From the presence of carious teeth or decayed portions of teeth many evils, both local and general, ensue. They are frequently the cause and the sole cause of glandular swellings in the neck, terminating in or combined with abscesses; of enlargement and inflammation of the tonsils, either chronic or acute; of ulcerations of the tongue and lips, which often assume a malignant action from continued irritation; and of continued constitutional irritation, which may give rise to serious disease."

Necrosis of the Jaw.—Necrosis of the jaw, arising from diseased teeth, was illustrated by the two cases in infants related in my first paper. Instances similar to these in their origin and history commonly occur in adults. Inflammation of the sockets of diseased teeth, extending to the periosteum of the jaw, proceeds to suppuration, and terminates in death of a portion of the body of the bone. In this stage the disease passes from the province of the dentist to that of the surgeon. It may, however, be useful to relate the following case, which is still under treatment, and which I have had repeated opportunities of examining in consultation with Mr. A. Trehern Norton. He agrees with me that the mischief, undoubtedly, had its origin in the dental disease.

J. T—, aged thirty-six, applied to Mr. Norton in January last, with the left side of the face extensively enlarged. The swelling was soft and fluctuating in two places, one beneath the malar bone, the other in the submaxillary region. Both of these were opened and a large quantity of offensive pus was evacuated. On examination with a probe, necrosis of the body of the jaw was detected through the lower orifice, but bone was not felt through the upper one. On looking into the mouth it was found that the molars on the

diseased side were much decayed. The gum was swollen and spongy, and offensive matter flowed into the mouth. The first molar was now extracted, and attached to it came away a portion of the outer lamina of the bone with the alveolus, forming together a mass of greater size than the tooth. The mischief, however, did not cease here, and a profuse discharge continued to flow from both the external openings, as well as into the mouth. I now extracted the second molar and the wisdom tooth, and found on further exploration that the necrosis involved the coronoid process. The patient, a highly intelligent man, gave a clear history of dental caries leading on to periostitis, and resulting in the extensive necrosis above described.

This case, as I have observed, is still under treatment, but on some future occasion I shall probably report its result.

Ulcers of the Tongue.—Ulcers of the tongue are not rarely caused by the constant friction of that organ against the ragged edges of decayed teeth.

The following is an exemplification of the serious aspect which this at first trifling affection may assume, and it illustrates the fact that, in

these cases, the injury is so gradually inflicted that the patient often remains unconscious of the true seat of the irritation.

T. F—, aged sixty, was sent to me on November 29th, 1867, by Mr. Reid, the house-surgeon at the West London Hospital. Three months before this he had sustained a fracture of the lower jaw on the left side. The case appeared to go on well, but he suffered a good deal of pain. When, however, the fracture became firmly united, the pain was so much aggravated by mastication that he had altogether abandoned the attempt to take solid food. His tongue was swollen and painful, and the glands below the jaw were enlarged, indurated and tender.

Being old and feeble he was reduced to a truly critical condition by his constant sufferings, combined with the inability to take solid food.

The recent fracture would have led one to the belief that mischief was impending in the bone. On a careful examination, however, the true nature of the case was revealed. A decayed molar had been driven inwards by the blow that had caused the fracture, and the tongue in constant movement against the ragged edges of this tooth had become abraded and ulcerated along a

considerable extent of its left border and under surface. On the extraction of the offending tooth the ulcer healed, and all the local symptoms subsided in the course of a week.

Abscesses in connection with the Teeth.—Abcesses in connection with the teeth are seen in their simplest and commonest form in the ordinary "gumboil." This consists of a collection of matter confined between the gum and the bone, resulting from inflammation of the lining membrane of the socket of a tooth. In a severer form of the same affection the cheek becomes involved in the inflammation, great swelling takes place, and lymph is thrown out which proceeds to suppuration. At this stage the matter, if it do not find a free exit into the mouth, will frequently, and more especially when aided by poultices, point and burst externally. Thus there results a fistulous tract between the diseased tooth and the external surface of the cheek, which remains open and discharging as long as the inflammation continues.

A case of this kind was mentioned in my first paper. Similar instances constantly present themselves; sometimes in private practice, but more often among hospital patients, who are more prone

to neglect their diseases until they assume an aggravated form.

There is a popular error on this subject which prevails to some extent, even among the more intelligent classes. The belief is that it is both difficult and dangerous to remove a tooth when great swelling and inflammation of the soft parts are present. There are no grounds whatever for such a belief. The tooth is usually loose, and there are no special difficulties attending its extraction. No harm can possibly arise from the operation, while on the contrary, much good must follow it. It provides at once a free vent into the mouth for the matter and so does away with the danger of the bursting of the abscess through the cheek. The tooth has usually to a great extent lost its vitality and constitutes the sole cause of the mischief. We accordingly find that after its removal further treatment is seldom required.

When ignorant of the true nature of their malady or loth to believe that mischief so extensive could arise from the teeth; patients often endure prolonged and severe suffering, to the serious detriment of their general health. They are fortunate when, as in the following case, necrosis of the jaw does not also ensue.

Mrs. W—, was brought to me by Mr. Musgrave of St. John's Wood, on April 20th, 1869. About a year previously an ineffectual attempt had been made to extract a lower molar, the crown of the tooth alone having been broken away. She subsequently suffered great pain, and the side of the face became considerably swollen. Poultices were applied and an abscess formed and burst externally. The discharge continued for many months until the patient was reduced to a condition of great debility. At length she came under the care of Mr. Musgrave, who, as soon as she was able to leave the house, brought her to me.

I found the parts about the left side of the jaw much enlarged and indurated. There was an opening near the left angle of the jaw discharging freely. The case altogether closely simulated necrosis of the jaw. There was indeed good reason to suspect—although it did not appear on examination—that injury to the bone had been inflicted by the long-existing inflammation. There could however, be no hesitation in removing the broken tooth—the primary cause of the mischief. Nitrous oxide gas was therefore administered and the roots were removed. The patient was then sent home. In the course of a few days it became evident from the rapid subsidence of the local

symptoms that there was no dead bone to come away, and that the case would soon be so far well. As soon as she had regained a little strength the patient was removed to the sea-side.

The offending teeth in these cases are easily detected, being as a rule loose and extensively carious, and having the gum about them inflamed and swollen, with matter oozing from it on pressure.

The following case illustrates several interesting points. First, it shows that occasionally there may occur some difficulty in fixing upon the exact seat of disease; secondly, that periosteal suppuration may take place in the alveoli of comparatively healthy teeth; and lastly, that in such a case the teeth should not be too hastily extracted, for the disease may subside under other treatment, without any consequent permanent injury to them or to the neighbouring parts.

X—, aged twenty-seven, assistant surgeon at a metropolitan hospital, travelling by railway, in September, 1867, had symptoms of inflammation on the left side of the lower jaw, induced by the draught during the journey. Two days after this a small quantity of matter could be pressed from the gum, which overlapped the partly cut wisdom tooth of the affected side. The inflammation soon

extended to the cheek, where a dense hard mass became evident, from the deposit of lymph in the tissues. The pain was considerable behind the wisdom tooth, as high as the coronoid process. Matter still continuing to flow from the gum, a free incision was made down to the periosteum. Iodide of potassium in decoction of bark had been taken from the first. This treatment did not, however, prevent the swelling in the cheek from suppurating, for that also softened and burst into the mouth. The parts now rapidly healed, and nothing remained but slight tenderness along the ascending ramus of the jaw.

Towards the end of October, X— again caught cold while partridge shooting in wet weather, and all the previous symptoms returned. The gum became inflamed and spongy, so that it was impossible to close the teeth or to masticate; and the hardness and swelling of the cheek again supervened, this time with œdema extending to the eyelid.

By degrees the more acute symptoms subsided, but there remained a peculiarly circumscribed hard swelling, about one inch in diameter, situated on the cheek opposite the anterior lower molar. This persisted for many days, when it was opened externally, and a small quantity of pus escaped.

Poultices were applied, and matter continued to escape during a period of more than three weeks. X— now left town for a few days, and the wound suddenly healed.

It must be here remarked that, on examining the mouth after the subsidence of the first attack, it was found that the first and second molars contained small fillings, and that the wisdom tooth was partly concealed in the ramus of the jaw. There was slight and equal tenderness of each of these teeth. It was thus impossible confidently to fix upon either of them as the exciting cause of the mischief, and it was therefore resolved to adopt the ordinary treatment for periostitis, and to await the result. This decision proved a wise one, for, in time, all the symptoms disappeared, leaving behind no trace whatever except a small and scarcely noticeable scar on the cheek.

Abscesses connected with diseased teeth, are usually readily traceable to their origin. The matter may, however, burrow through the soft tissues, and appear in situations so unusual that their relation to the teeth would not at first sight be suspected. The following are illustrative examples, and they show that, in cases of abscesses

about the face, whose origin is not otherwise evident, it is very important that a careful examination of the teeth should be made.

The first I saw with Mr. A. T. Norton. It was that of a little boy, ten years old, who had, near the inner corner of his right eye, a fistulous opening, simulating exactly in situation and appearance lachrymal fistula. The opening had existed during several months, and had continuously discharged thin purulent matter. A probe, passed into the opening, was found not to take the course of the lachrymal duct, but to traverse the front of the bone to near the alveoli, and pushed onwards, it appeared in the mouth over the canine tooth. This tooth was necrosed. It was extracted, and pus followed immediately, and continued to flow from the alveolus for a few days. There was, however, no further discharge from the opening on the face, and the parts healed rapidly after the removal of the tooth.

The next case was sent to me by Dr. H. F. Parsons, of Beckington, to whom I am also indebted for the latter portion of the details. The subject was a gentleman about twenty-five years of age. He came to me in May, 1868, suffering

from periostitis of the second right upper molar. This got well under treatment, and the tooth remained serviceable in mastication until the middle of August, when the periostitis returned and gave much pain for a week, in spite of iodide of potassium, and a couple of leeches prescribed by Dr. Parsons. An offensive purulent discharge was now observed to trickle from the nostril of the right side, when the head was inclined forward. In a few days more this discharge became thin and acrid, bringing tears into the patient's eyes. The tooth which had ached was then extracted, and the discharge at once ceased. Dr. Parsons informed me that there had been no symptoms of inflammation of the antrum. What happened was evidently this. An alveolar abscess connected with the aching tooth had burst into the antrum, and the matter had found its way through the natural opening into the nose. Dr. Parsons remarked how closely in this instance ozœna was simulated, and indeed had not the history of dental disease been clear, it is easy to perceive that the case might have been mistaken for that affection.

An examination of the varied phases of dental disease leads one to appreciate fully the im-

portance of the part which the teeth take in influencing health. We see that these organs cannot be neglected with impunity, and that their preservation or restoration may often be the means of alleviating much suffering, of assisting in the eradication of grave disease, and thus of prolonging life. It becomes also evident that dental diseases must not be regarded as entirely local and isolated, for their effects spread to neighbouring parts, and they act upon and are themselves influenced by many constitutional conditions. Further, it is rendered clear that these affections involve and give rise to a great variety of morbid processes, as for example, those which constitute inflammation and its sequelæ. Now, these morbid processes are essentially the same in their nature, in whatever organ or situation they may appear; and their treatment is invariably based upon the same fundamental principles of medical science. Hence it is that although he confine his attention exclusively to some distinct organ or part, the practitioner must, nevertheless, be duly acquainted with these general principles of science, if he would deal rationally and successfully with disease. To this there may be added that, when science is ignored, and when the treatment of disease is carried out as a mechanical

routine, the result is not only frequent failure, but often also the infliction of great injury and intense suffering upon the patient. Ignorance here we may thus understand is very closely allied to cruelty, and therefore under no circumstances can it be tolerated.

From the consideration of these facts, we discover that ample justification exists for the efforts which have been made during late years to rescue dentistry from the hands of the ignorant charlatan, and to place it in those of the educated practitioner. It might, however, be alleged that dentistry, strictly confined to the treatment of the diseases of the teeth, constitutes a mere mechanical art. A similar belief was current not many years ago, with regard to surgery, when this branch of practice was pursued to a great extent as a handicraft. It can be shown that dentistry is no more a mechanical art than surgery. The practice of each it is true consists to a great extent of the application of mechanical apparatus, and of the use of cutting, sawing, and gouging instruments. But besides manual dexterity in the use of his tools, the surgeon is required to possess an adequate knowledge of anatomy, physiology, and pathology, —the sciences upon which his art is based, for it is found that without such knowledge his treat-

ment must prove commonly unsuccessful, and in many cases disastrous. From the dental surgeon there are demanded similar acquirements, for without them, even in what at first sight appear to be simple mechanical details of practice, he also must be liable to many errors, and his treatment must constantly fall short of success, if indeed it do not aggravate the very mischief for which a remedy is sought.

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